

ENHANCED SEARCH ENGINE

TECHNICAL FIELD

The present invention relates generally to a means for enhancing a search engine and in particular, providing search-related information derived from one or
5 more entities known to the user.

BACKGROUND ART

The interconnectivity of individuals and organisations has increased exponentially in recent times with the advent of various telecommunication means, including the Internet. The very success in information availability and distribution
10 afforded by the Internet has placed a premium on effective means of identifying information relevant or interesting to the user. Internet search engines are the most prevalent means of extracting relevance from the ever expanding wealth of internet material. However, the majority of search engines suffer from numerous shortcomings.

15 The sheer volume of information available on even the most esoteric subjects requires search engines to filter and prioritise the search results. The mechanisms by which this ranking is achieved include:

- a) Keyword frequency and meta tags;
- b) Professional editors manually evaluating sites;
- 20 c) How much advertisers are prepared to pay, and

d) Measuring which web-sites webmasters think are important. This is done by link analysis, which gives more weighting to sites dependant on what other sites are linked to them.

US Patent No. 6,421,675 (enclosed herein by reference) discloses a means of refining searches according to the behaviour of previous users performing the same search. While this removes the web-site from its sole dependency of the above criteria a)-d) for its ranking, it is still driven by the influence of the whole web populous, whose interests and tastes may differ greatly from a given individual user.

It would be desirable to provide a means of influencing the ranking or weighting of search results according to the preferences of entities (individuals, groups or organisations) deemed of more relevance or importance to the user.

PCT/NZ02/00199 (incorporated herein by reference) also by the present applicant discloses a personal contact network system whereby a user may form a network of contacts known either directly or indirectly to the user. The network may be used for a variety of applications and takes advantage of the innate human trait to give a higher weighting to the opinions of those entities with whom a common positive bond is shared, such as friendship.

As outlined in patent application PCT/NZ02/00199, incentives to restrict the distribution and flow of information within a network (or the search results of a search engine) include obtaining some form of filtering of irrelevant, useless, unwanted, offensive, intrusive or in any way undesirable information or interaction with other nodes/entities. Humans consciously and subconsciously already utilise such filtering in their daily life by placing greater weighting on information from friends and acquaintances than from unfamiliar sources.

Throughout virtually every aspect of human life, economic, social, personal and business decisions are either directly or indirectly affected by the preferences, tastes and actions of our friends, colleagues and acquaintances. This is in contrast to widely accepted economic theory in the fields of, for example,

5 consumer purchases where it is assumed individuals make rational choices based upon the available product or service information. In actual fact, a recommendation or an adverse comment from a close trusted acquaintance regarding a specific product will often override other factors in a commercial purchase decision, rightly or not. There are many other areas in which the

10 opinions of respected acquaintances or even organisations can affect the decision making of individuals or organisations.

Examples of just a few applications or activities in which trusted or respected contacts or recommendations play a significant role include seeking employment and filling job vacancies, investment opportunities, academic co-operation,

15 finding accommodation or people to share accommodation with, buying and selling goods and services, arranging social/sporting functions, finding friendship, romantic and/or social relationships and so forth.

Contemporary living has confronted many individuals with a daily surplus of information. This bewildering array of choices and decisions vies for the

20 individual's attention in almost every aspect of their work, recreation, and social lives. The vast majority of information sources received by most individuals is biased to some extent by commercial interests. Consequently, there is at least the perception the information may be incomplete, misleading or false. The lack of independent objectivity from these information sources leads to scepticism

25 and/or a sense of futility, helplessness, or ambivalence in obtaining worthwhile advice. In contrast, a recommendation by a trusted friend of a particular product,

service or the like, is likely to be given far greater weighting. Such recommendations will often be accorded far greater significance than any number of expensive, professionally produced, and theoretically compelling advertisements/product recommendations.

- 5 An individual may seek a friend's opinion on a variety of issues, aside from commercial purchase issues. The choice of plumbers, dentists, lawyers and other suppliers for example, may be strongly influenced by personal recommendation. Whilst such specific choices may only arise infrequently, friends and acquaintances are often in frequent contact and may cover a wide
- 10 range of matters, including opinions/recommendations on issues such as books, films, entertainment, restaurants, and many others.

It would thus be desirable to harness the recommendations, opinions and discriminatory abilities of a user's friends, acquaintances (or any other entity known directly or indirectly to the user) to enhance the results of a search engine.

- 15 It would also be desirable to provide a user with indicative information derived from the search activities conducted by the members of the user's unique personal network.

- All references, including any patents or patent applications cited in this specification are hereby incorporated by reference. No admission is made that
- 20 any reference constitutes relevant prior art. The discussion of the references states what their authors assert, and the applicants reserve the right to challenge the accuracy and pertinency of the cited documents. It will be clearly understood that, although a number of prior art publications are referred to herein, this reference does not constitute an admission that any of these documents form
- 25 part of the common general knowledge in the art, in New Zealand or in any other country.

It is acknowledged that the term 'comprise' may, under varying jurisdictions, be attributed with either an exclusive or an inclusive meaning. For the purpose of this specification, and unless otherwise noted, the term 'comprise' shall have an inclusive meaning - i.e. that it will be taken to mean an inclusion of not only the
5 listed components it directly references, but also other non-specified components or elements. This rationale will also be used when the term 'comprised' or 'comprising' is used in relation to one or more steps in a method or process.

It is an object of the present invention to address the foregoing problems or at least to provide the public with a useful choice.

10 Further aspects and advantages of the present invention will become apparent from the ensuing description which is given by way of example only.

DISCLOSURE OF INVENTION

According to one aspect, there is provided a search engine system capable of displaying *indicative information* to a user from searches performed by one or
15 more entities connected directly or indirectly with the user,

In one embodiment, said entities are '*user contacts*'.

According to a further aspect, the present invention includes a system providing the user with a private *personal contacts network of user contacts*.

As used herein, the term 'entity' or 'entities' refers to any individual, family,
20 personal or *organised network*, organisation, club, society, company, partnership, religion, or entity that exists as a particular and discrete unit.

The term 'search engine' is not necessarily restricted to Internet search engines and may also include any other electronic data search systems for interrogating

databases and or networks. Although the present invention is described herein with respect to an Internet search engine, it should be understood this is for exemplary purposes only and the invention is not necessarily limited to internet application.

- 5 Preferably, each *user contact* includes a *connection factor* indicative of the degree of separation between the *user contact* and the user.

Preferably, said private *personal contacts network* provides *interrelationship context information* between said entities and/or between a *user contact* and the user, said *interrelationship context information* including said *connection factor*
10 and optionally one or more *entity attributes*.

Preferably, said system *entity attributes* include at least one *identifying characteristic* and optionally, information regarding personal details, factors or interests; friends; relations; school alumni; employment factors; business colleagues; professional acquaintances; sexual preferences, persuasions, or
15 proclivities; sporting interests; entertainment, artistic, creative or leisure interests; travel interests, commercial, religious, political, theological or ideological belief or opinions; academic, scientific, or engineering disciplines; humanitarian, social, security/military or economic fields and any combination of same.

Searches include any interrogation of a database via a network, in particular a
20 search of web-sites via the internet.

Preferably, each search includes user inputted *keywords* and an output of search results.

Keywords may include one or more words, phrases, images and/or any other alphanumeric characters.

In its broadest sense, the present invention provides two forms of *indicative information*, namely search *suggestions* and search results *weighting*. Whilst both forms of information are known, neither has been previously derived from the search activities of the *user contacts*.

- 5 Thus, according to a further aspect of the present invention, the *indicative information* includes search *suggestions*, and/or search results *weighting* derived from searches, search results, or other network/internet-related activities of the *user contacts*.

- This enables a powerful insight into the activities of the *user contacts* which may
10 be of direct relevance for a variety of reasons. In the case of close friends (i.e. direct contacts) the *suggestions* are likely to be in areas of similar interest to the user, or of interest purely due to the existing relationship between the entities. Similarly, if the linking *interrelationship context information* between the entities and the user is a common *entity attribute* of membership of a common
15 organisation such as a large company for example, the *suggestions* from the other entities may be of relevance for commercial purposes.

According to one embodiment, said *suggestions* include, but are not restricted to;

- *recent searches* denoting the most recent *keywords* or search results (such as a list of web pages) associated with the *keywords* used by the *user*
20 *contacts*;
- *recent web-sites* denoting the most recent web sites accessed by the *user contacts* either directly, or via *recent searches*;
- *popular web-sites* denoting a ranking of web sites most regularly visited by, and/or recommended by the *user contacts*;

- *popular searches* denoting a ranking of the most popular *keywords* or search results associated with the *keywords* used by the *user contacts*,
- *high-flying searches* denoting a list of *keywords* or search results associated with the *keywords* ranked according to their rate of increase in the *popular searches* ranking.
- *high-flying web-sites* denoting a list of web-sites ranked according to their rate of increase in the *popular web-sites* ranking.
- popular or recently accessed paid web listings.

According to a further aspect of the present invention, the *suggestions* may be based on a *selective input* from the *user contacts* filtered according to at least one *filter criteria* including the elapsed period since the *suggestion* creation, the *interrelationship context information*, the *connection factor* and/or *entity attributes* of the contributing *user contact*

The *suggestions* may be displayed adjacent the search results or as an optional toolbar or window with corresponding labelling or some generic terms such as "*What's Hot*" or the like.

In order that very popular *suggestions* do not dominate for prolonged periods, each *suggestion* may have an associated *decay factor*. The *decay factor* may be a number between 0 and 1 and be varied according to the nature of the *suggestion* is so that the perceived popularity does not last indefinitely.

An automatic human response to viewing a listing or ranking is to perceive greater importance of the results at the top of the list, even if the order of the listing is stated as of being random or un-prioritised. Thus, to overcome this inherent bias, greater *weighting* may be applied to listings such as the search

results or the *suggestions* according to their position down a list, when calculating their perceived popularity.

The present invention may make use of the private *personal contacts network* system described in the earlier co-pending PCT application PCT/NZ02/00199,
5 which discloses means for creating such a network, operating same, and a range of possible applications. Numerous methods of enhancing the quality of the search results provided by search engines according to particular search queries are known, including those disclosed in the applicant's earlier patents US Patent No. 6,421,675, US10/155914, US10/213017 NZ518624 PCT/NZ02/00199 and
10 NZ528385, which may be utilised by the present invention and thus incorporated herein by reference.

Preferably, in addition to a *connection factor* indicative of the separation between an entity and the user, said *interrelationship context information* optionally also includes a *connection factor* indicative of the separation between *user contacts* in
15 said private *personal contacts network*.

It will be appreciated that there is a distinct difference in the present invention between *organised networks* and *personal contacts networks*. An *organised network* forms a group/organisation with defined memberships who all have a common aim, or interest such as, commercial organisations, companies,
20 corporations or groupings; political parties; academic or engineering institutes; sporting bodies and so forth. Thus, all *organised network* members have at least one common *entity attribute*, i.e. membership of the *organised network*.

In contrast, a *personal contacts network* is formed from contacts with friends and colleagues that are unique to an individual. Thus, an individual user of the
25 present invention may be linked to other entity's *personal contacts networks* and

be linked (or even be a member of) *organised networks*. The present invention provides the flexibility to regard *organised networks* such as a commercial company or an institute of engineers as a single *user contact* with various *entity attributes* relating to the whole company/organisation, an/or to consider the
5 individual members of the *organised networks* as individual *user contacts* with at least one common *entity attribute*. Which of these options is followed may be varied according to the nature of the search being undertaken by the user

Preferably, access to the *interrelationship context information* between the user and said entities may be restricted. According to one aspect of the present
10 invention, said restricted access is defined by the user.

Preferably, each said *identifying characteristic* includes the entity's name and preferably a means of contacting the entity, including an e-mail address; telephone and/or facsimile number; postal address and/or any communication means capable of individually communicating with the entity or any combination
15 of such means.

Preferably, said *identifying characteristics* also optionally include at least one of said *entity attributes*.

Optionally, said *identifying characteristics* may include *supplementary attributes* of said user or entity.

20 Preferably, an entity becomes part of the network system by independent registration or by accepting an invitation from a registered entity, i.e. a *user contact*.

Entities agreeing to inclusion in a user's *personal contacts network* are said to be *direct user contacts*. According to one embodiment, entities included in the

database system which are indirectly or unconnected to a user may become directly connected by mutual agreement, preferably by one entity sending an invitation and the other accepting. Potential users of such a system can be reassured that they will be included in a private network whereby only others with
5 a common *connection factor* (e.g. friends, friends of friends, or friends of friends of friends and so forth) will be able to access their personal details if they choose to make them available.

The present invention enables information flow not only between immediate acquaintances, but also with the subsequent tiers of entity acquaintances, e.g.
10 friends of friends, friends of friends of friends, and beyond to include even larger domains entities. The core principles and elements of the invention, namely the ability to transfer search and web-related information within a network whose members are directly or indirectly known to the user, giving an interrelationship context to any information transfer, may be applied a diverse range of
15 applications without need to adapt the principles of operation.

As referred to herein, if two entities are linked through any number of intermediate entities they are said to be "connected". Furthermore, if two entities exist independently in the database system or a *personal contacts network* with no intermediate entities connecting them, they are said to be "disconnected".

20 In one embodiment, the said *connection factor* incorporates a *connection path* length between two entities, given by the minimum number of connections in a chain of entities separating two entities.

In a further embodiment, the said *connection factor* incorporates the degree of separation between two entities and is equal to the shortest *connection path*
25 length of all the available *connection paths* between the entities, wherein an

entity that is directly connected to another entity is said to be a *direct contact* giving a "1st degree contact," and has a *connection path* length of one; two entities connected via one intermediate entity are said to be "2nd degree contacts," and have a *connection path* length of two, and wherein any two entities
5 whose shortest *connection path* is via "N-1" intermediate entities (if any), with a path length of "N" are an "Nth" degree contact, where "N" is an integer. Entities having a 2nd or higher degree contact are said to be *indirect contacts*, or indirectly connected.

According to one embodiment, the present invention is configured to allow a user
10 to apply a *selective input* to the user's *suggestions* by using a *filter criteria* of controlling the value of Nth degrees contact of entities to be included, where N is a variable determined by the user.

In a further embodiment, the *filter criteria* for said *selective input* may be linked to a predetermined activity. Thus, if the user is interested in a particular event, or
15 activity, they may tailor their *user contacts* to reflect particular aspects of the predetermined activity.

Alternatively, a user engaged in one or more said predetermined activities may specify the action to apply to

- all degrees of contact in the user's *personal contacts network*, at any
20 *connection path* length, or
- the entire system network of all nodes, including those who are not connected to the user.

Preferably, said applications include (but are not limited to) consumer decisions, buying, selling, trading loaning; finding flatmates/roommates, tenants; organising

activities and events, recommendations/opinions including those related to films, plays, books, employment, services, tradesmen, accommodation, restaurants and the like, comparison and explorations of common interests, e.g. horse riding, snowboarding, etc; sharing peer-to-peer personal or business creative work or
5 content, e.g. photos, art-work, literature, music; managing a club or society; locating/supplying/"blacklisting" providers of goods or services; business or technological advice unsuitable for publication; recruitment, job-seeking; estate agents; venture capital; collaborative ventures; referrals; police/security information gathering/informants; event manager; address book manager;
10 headhunting; book mark service; spam filtering; car sharing; sales leads; market entry advice; real-estate; sharing personal or business files; company knowledge management; medical advice; travel organiser, lending/borrowing; house-sitting; baby-sitting; classified advertisements; finding musicians.

In addition, the present invention permits said *selective input* to be received from
15 networks outside the system network.

It will be appreciated that there are numerous potential reasons for limiting the degrees of separation of entities used by the user for any *selective input*, said reasons including, but not limited to, social, economic, or political contexts such as trust, discretion, interest, association, preference, shared experience,
20 ethnicity, religion, language, location, allegiance, alliance, treaty, politics, or governance.

It will be appreciated there are numerous methods of customising the *selective input* to the user's *suggestions*. In one embodiment, the *suggestions* are a weighted average of *direct contacts* and *indirect contacts*. In alternative
25 embodiments, the *selective input* may be defined by the user.

The *user contacts* associated with the *suggestions* most frequently chosen by the user may be designated *preferred user contacts*. The designation of *preferred user contact* may be performed directly by the user, or calculated by the system by determining the *user contact* associated with the most popular *suggestions* previously selected by the user.

In yet further embodiments, the *selective input* may be at least partially *weighted* to *suggestions* from the *preferred user contacts*.

The search engine system effectively learns which *user contact suggestions* the user prefers. These may not necessarily be *direct contacts* of the user and may indirectly indicate a potential similarity in interests or tastes with that entity. The present invention thus provides a means (described more fully later) for contacting the entity to further pursue the potential common ground.

Alternatively, the *selective input* may be varied according to other known factors regarding the *user contact* including the *interrelationship context information*, the *connection factor* and/or *entity attributes* associated with the contributing *user contact*.

The user may for example balance the number (and degree of contact) of *user contacts* to provide the *selective input* for the *suggestions* against the variety and volume of the *suggestions* generated.

This present invention may readily be configured to specific items or issues people search for such as news, pictures, books, auctions, products, chat rooms, games, e-cards, investments, song downloads, etc.

People naturally tend to share an interest in the same news items as people in their social network (either *personal contacts networks* or organisations). The

present invention provides a powerful means to sort news items according to the interests of the direct *user contacts* for example, (or to optionally extend that to 2nd degree, 3rd degree, or further contacts or *organised networks*) thus providing an effective filter for the thousands of available stories on any given day.

- 5 It will be appreciated that during the initial use of the search engine, there will not be any existing *suggestions* from *user contacts*. Instead, the same searches may be populated by results from searches from all the users of the search engine.

As previously discussed, in addition to providing *suggestions* to the user, the
10 present invention provides *weighted* search results. This *weighting* may be provided in addition to, or instead of the existing mechanisms, namely:

- *Keyword* frequency and meta tags;
- Professional editors manually evaluating sites;
- How much advertisers or web-sites are prepared to pay, and
- 15 • Measuring which web-sites webmasters think are important. This is done by link analysis, which gives more *weighting* to sites dependant on what other sites are linked to them. The overall popularity, the popularity of a sub set of users (e.g. NZ people, engineers) or the user's own previous searches (as disclosed in US 6,421,675)

20 The present invention determines the relevance of the search results according to the preferences of the user's unique private *personal contacts network* of contacts as discussed above. In a similar manner to the means of generating the *suggestions*, the search results associated with a *keyword* may be *weighted* according to a *selective input* from the *user contacts*, including *filter criteria*

related to the *interrelationship context information*, the *connection factor* and/or *entity attributes* associated with the contributing *user contact*.

Thus for example, the user may give a stronger *weighting* for 1st degree contacts compared to 2nd degree contacts. Using the example of a search under the
5 *keyword* terms "holiday destinations", the user could learn their network of contacts shows a preference for skiing in the France during the winter and for the Greek islands during summer. However, a different user may have seen different results even if they live in the same location, and even had the same occupations, as their *personal contacts network* of contacts would inevitably be
10 different, with consequently different holiday preferences.

The search results may be further refined by specifying the *selective input filter criteria* to include various *entity attributes* relevant to the search such as a particular occupation, sporting interest or the like. Conversely, if a particular set of *filter criteria* closely match an entity *disconnected* from the user, the system
15 may prompt the user to prompt the entity to be *connected* to the user

Equally, the system may prompt the user for communication (e.g. e-mail, Instant messenger, phone etc) with a *user contact* who last performed the search, or recommended a particular web-site/search result. This communication may be via a link (e-mail or we link) adjacent to the *keyword* search terms and/or web-
20 sites and could be configured to be either anonymous communication or not.

In one configuration for example, the *user contact* is not initially identified to the user, though the user is identified in the e-mail via some form of *interrelationship context information* such as the *connection factor/entity attribute* e.g. your direct contact Rick knows Sue (your 2nd degree contact who knows the sender directly.

The *user contact* may respond anonymously (via a web-site) or reply to the e-mail including their direct e-mail address.

Self-evidently, most web-sites seek to maximise the number of users visiting their site. The present invention provides a means for web-sites to receive more web-traffic by promoting the search engine to their customers.

According to one embodiment, a participating *partner web-site* (e.g. a commercial retail web-site) is given a unique link (a URL, a 'clickable' graphic or search box) to the search engine, configured such that users clicking on the search engine link are linked to a search page with the participating web-site listed as the top of the *popular searches* and/or *recent web-sites suggestions* listing.

Any user accessing the search engine via this route who then invites their *user contacts* to also use the search engine service will also see that participating *partner web-site* listed and may visit the site. Thus, the *partner web-site* may use the present invention as a means of marketing themselves to the *connected entities* of their existing customers.

It is also a means to increase utilisation of the present invention by providing web-sites with an incentive to include a link to the search engine without any direct drawback. Further web-sites may be enticed to become *partner web-sites* and include a link to the search engine if webmasters of web-sites already using the search engine invite webmasters of other web-sites to use the search service whereby in return both web-sites are listed under the appropriate *suggestions*. Thus, each participating web-site has an incentive to get other web-sites to use the search service as it will generate more traffic for their own site.

According to a further aspect of the present invention, the search service may also be configured to conduct searches solely of material on the *partner web-site*

instead of, or as well as 'all internet' searches. The *partner web-site* may also display a list of *suggestions* either based on the generic search activities of all users, or for users having their own private *personal contacts network*, customised to reflect the *suggestions* associated by the activities of their *user*

5 *contacts* on the *participating web-site*. On appropriate commercial web-sites, a *recommendation* to related products to the one being searched for which were bought, viewed, subscribed to and so forth may be made by previous *user* *contacts* to the site.

The product or other search *recommendations* may not necessarily be restricted

10 to a single web-site, whereby the user may view relevant searches previously accessed by their *user contacts* across a number of (*partner* and non-partner) sites, thus increasing the web-activity on all the web-sites involved.

For example on the 'all internet search', *recommendations* may direct users to do a search on a *partner web-site*. This will enhance traffic to the *partner web-site*.

15 Similarly, on a *partner web-site*, *recommendations* may direct users to do a search on the 'all internet search' or to another *partner web-site*.

A further aspect of the present invention is the method for a *partner web-site* or *broker* to act as an intermediary between advertisers (or representatives of advertisers) and sites which feature the search engine and *suggestions* relevant

20 to the advertiser product(s), service(s), website(s), or company(ies).

In one embodiment, a *partner web-site* would offer a service directly to advertisers or representatives of advertisers. They could offer the advertiser two variations of advertising to the users of the *partner web-site*. In one variation, the advertiser *suggestion(s)* would be made available and seeded to all the users of

25 the *partner web-site* or a subset of them, and word of mouth amongst those

users and their contacts would help spread the visibility of the *suggestion(s)*, possibly in the form of *recommendations*.. In another variation, the advertiser *suggestion(s)* would be seeded to those *partner web-site* users who had previously shown interest or propensity to click on similar *suggestion(s)*.

- 5 In another embodiment, the owner of the present invention could provide the broker service as an intermediary between advertisers and *partner web-sites*. Then the partner web-sites would not be involved in the selection of advertisers and *suggestions* but would simply make their user base available for the seeding of *suggestions* and distribution of *recommendations*.
- 10 In a third embodiment, the owner of the present invention could present it to firms currently working as *brokers* or providing web search advertising directly, in which they sell sponsored search results to advertisers at fixed-price or auction, while guaranteeing the advertiser a certain position in the results presented to a user who performs a search on the *keyword* purchased by the advertiser. These
- 15 firms would then be able to offer an additional service, in which advertisers bid for or buy the right to be included in *suggestions* to partner site users and individual users or networks of users who have indicated an interest in or shown a propensity to click on similar *suggestions* or *recommendations*

- Instead of using a full Internet web-browser window to access the search engine,
- 20 the user may download a toolbar that remains resident through all the user's web-browser usage. Such downloadable toolbars are known, however, the technology may be enhanced by incorporation of the present invention. Firstly, in known manner, the toolbar permits searches to be performed directly from the user's web-browser without need to access a separate search engine web-site.
- 25 Secondly, the tool bar could also monitor the web-sites accessed by the user

directly without conducting a *keyword* search as part of the determination of the *suggestions* data and *search weightings*.

The tool bar may also display or provide access to the most recent *suggestions* data from the *user contacts*.

- 5 The monitoring ability of the toolbar enables the system (with the user's permission) to track the user's web-surfing activities to all web-sites. Consequently, upon accessing a particular web-site, the user may be optionally notified by the toolbar of their *user contacts* who visited that site, and what a subsequent sites the *user contact* accessed.
- 10 As an example;
- 1) A User is informed by a *user contact* X of a web-site Y related to holiday homes in New Zealand.
- 2) The user accesses site Y and is notified on the toolbar that (optionally) *user contact* X accessed this site, or (if the *user contact's* identity is withheld) notified
- 15 that when some of their *user contacts* from their network accessed site Y, they also visited site Z. *User contact* X may optionally have made a *recommendation* regarding either site Y or Z, which is also notified to the user via the toolbar.
- 3) The web-site Y and or Z can pay for the privilege of being at the top of this notification list.
- 20 According to a further embodiment, the search engine may also be configured to provide the user with *notifications* of further specified occurrences, including access of a specified (or book-marked) web-site by a *user contact* and/or an associated recommendation to same, or further sites accessed after the book-marked site, or of any new material at, or links to, the specified site.

It will be appreciated that all the above-described features associated with the toolbar may also be performed by the full search engine.

As the *weighted search results* and *suggestions* are correlated to social networks and to the entity's individual identity, an enhancement of the *recommendations* feature it is possible to allow individual users to make comments in an *appraisal* regarding web-sites accessed via the search engine.

In a further embodiment, the search engine includes means for linking an *appraisal* with a search result and/or *suggestion*. Preferably said *appraisal* may include a *recommendation* (optionally graded) and/or *user comments*.

In one embodiment, said *appraisals* are performed via links associated with individual results on search results listing. Alternatively, the appraisals may be performed whilst accessing the search result or suggestion web-site via a link to the search engine. Thus, users could be invited to "comment on current site" which may typically involve identifying sites as particularly useful, useless, curious, or to be avoided and so forth.

The *user comments* may be in the form of unrestricted typed comments and/or selected from a predetermined list of *appraisal gradings*. Such predetermined gradings may be used to provide further *filter criteria* for *suggestions* or *weighted search results*, e.g. only show *suggestions* for web-sites given a good or interesting *appraisal grading*, or alternatively, ignore "useless" *appraisal gradings* from *user contact X*.

The *appraisals* are only visible to *user contacts* within the personal or *organised networks* to which the commentator belongs. Optionally, the commentator could include their identity or a means to contact them via the search service. A user inputting *user comments* on a healthcare site may state, "This really worked well

for me, but there are some things to watch out for. Get in touch if you'd like to discuss. Click to contact."

It is noteworthy that by comparison, a comparable system that allows unrestricted public annotations to web-sites and search results would not be trustworthy or useful because there is no confidence in the identity or character of the annotator. As an example, an annotation that a particular product or service is a "good" or "bad" one would lack credibility without any assurance that the annotator does not work for the company or for a competitor.

The feature of adding *recommendations* or *appraisals* may be readily extended to relate to issues not directly related to the web-site itself, as these comments will only be accessible to the *user contacts* in the user's *personal contacts network*. An infinite range of comments are possible, e.g. "A great book; borrow mine if you like", "This album rocks. Don't listen to it after 10pm or you'll be dancing on your bed", "Nice car but spare parts take months to find in NZ", "John O'Neill can eat all those tickets in a salad for all I care", "Careful, this is a scam" and so forth.

The feature of user *recommendations* may also be used as a factor in *weighting* the search results. As previously discussed, prior art search engines allow users to submit web-sites they consider should be included in the results for a given *keywords*. However, this system can be open to abuse by webmasters trying to obtain higher rankings for their web-sites.

In contrast, the present invention allows users to make *recommendations* (positive or negative) for web-sites that would cause their ranking to alter in a list of sites for particular *keyword* searches or *suggestions* for their network of contacts. The search engine system incorporates feedback on the efficacy of the

recommendations by the reaction of the *user contacts*. If the *user's contacts* concurred with the *recommendations* by active or automatically calculated *affirmations* (either by active voting or passively by clicking on the recommended web-site), the *recommendation* could be propagated through the entities in the social network.

A key advantage of the present invention over prior art systems of submissions to a search engine Webmaster is the discouragement for low quality submissions. Firstly they would have little effect other than degrading the search for the user's own *personal contacts network* of *user contacts*. Secondly, there is little incentive if the user responsible for repeatedly submitting low quality, misleading or otherwise dubious *recommendations* is identifiable to their *user contacts*.

According to a further aspect of the present invention, users are accorded a predetermined number of *recommendations* according to a predetermined user *recommendation credibility* criteria. In one embodiment, said *recommendation credibility* may be determined by active or automatic *affirmations* of said user *recommendations* by the *user contacts*. Alternative *recommendation credibility* criteria may include a fixed quota of *recommendation* over a specified time period, or linked to particular *entity attributes* for recommendations for web-sites associated with said *entity attributes*.

Thus, the *recommendation credibility* criteria may be determined according to a number of factors including (but not limited to)

- users who prove to their user contacts to submit germane recommendations may 'earn' the ability to make additional recommendations;

- each user may be give a fixed quota over a given time period, e.g. 10 recommendation per month;
- a user with a *entity attribute* particularly relevant to a particular search topic, e.g. a consultant paediatrician would be eligible for more recommendations for results associated with *keyword* searches such as "childhood illnesses" and the like.
- the size and quality of the user's personal social network, e.g. if they are linked to a lot of users that also have a high credibility.

A further and potentially very significant advantage is returning a sense of control over the search results to the users according to their own personal experiences and opinions of the web-sites. It is a common complaint of prior art search engines that the results for particular keywords appear illogical or distorted and that new or emerging web-sites or those without significant financial/lobbying resources fail to achieve worthwhile rankings. The present invention replaces the search engine's external control over the search results and empowers the users to provide meaningful rankings. For example, a user having a personal web-site can maintain the site as the top ranked result for the user and the *user contacts* for certain *keywords*, e.g. the user's name. The same *keyword* search by a different entity in a different social network could give a different search result – though this would be more relevant to them.

The present invention can also be used to create a list of searches (both within and outside the user's private network of contacts) that have unsatisfactory or no search results. Some conscientious users may undertake to locate relevant search results to overcome deficiencies for particular *keywords* to help their *user contacts* and these results can be stored and reused. Consequently, the search

results continuously improve over time. Users who provide such submissions could increase their *recommendation credibility* to increase how many recommendations they are permitted and optionally how far the sites are propagated. The *recommendation credibility* for a user could also be linked to
5 their number of *user contacts*, and/or the number of times people have clicked on *suggestion* submissions etc.

A further search engine service of the present invention provides an e-mail to users when another *user contact* has found some pertinent results for a previous search term used by the user.

10 Often, individuals within a company or an organised network (e.g. professional association, or club) will perform similar searches. This searching work is likely to be useful to others in the same organised network. For example someone in an engineering company searching for data on a particular material may find a particularly relevant research report. The search engine can store these search
15 terms and results and accord them a higher ranking for other users from the company or organised network performing the same search. This type of 'in-house' search activity may be used to create a corresponding list of *suggestions* specific to the members of the organised network/company.

As per the private network searches, the search engine system can be
20 configured to include a contact link adjacent the search results and search terms to permit contact with others in the company to discuss search results of relevance. The contact may again be anonymous or not.

In comparison to a conscientious user in a private network addressing deficiencies in a result for a particular search, a commercial company or

organisation may task an individual with such a task to ensure homogeneity and reliability for in-house data resources.

A peripheral benefit for companies/organised in sharing results via the present invention is that it doesn't add an additional burden on the amount of work
5 already being undertaken by the network members and in many instances will reduce unnecessary duplication of effort. The search engine may also be integrated into any existing Intranet search within the organised network.

Numerous refinements may also be incorporated in to the present invention according to the particular requirements of the users.

10 A fundamental requirement for ensuring the search engine users engage in meaningful information sharing via the suggestions and search results weighting is to provide the users with the power to discriminate what web-activities contribute, or are discernable to user contacts in their private network. A user searching for new employment or concerned about a potential serious illness
15 affecting their spouse for example may not want any of the details to be visible to their *user contacts*.

Thus, according to a further aspect of the present invention, the user may optionally select web or search activity for exclusion from contributing to said *indicative information*.

20 There are many possible configurations by which this feature may be implemented, e.g. having two search buttons labelled "private network search" and "Don't share this search" or "private search". This enables users to still conduct searches without being recorded for their *user contacts* to share. Alternatively, a simple "private search" check box may be used.

In a further embodiment, partner web-sites may use their own branded versions of the search engine. Thus, instead of just having their URL link at the top of the *popular/recent web-sites suggestions* list, the link could be customised to show the search engine with the partner web-site's brand/banner/logo at the top of the page together with use of their colours/fonts, layout etc.

According to a yet further aspect, the present invention provides the ability for a user to delete searches or web-activity from incorporation in said *indicative information*. This may be used to remove information inadvertently included, or to information which appears to the user with hindsight to be unhelpful, misleading or similar. In a further embodiment, each user is provided with an editable *history log* of every search they have performed and each web-site visited. The user may edit their *history log* and remove any search they did from the list of searches that are shared with their contacts, though deletion of searches initiated by the *user contacts* may not be edited.

In a commercial organisation or organised network, the search engine may be configured to disable any editing of the user's history log and or preventing any search or web-activity from being included in the *indicative information* compiled by the search invention and discernable to the *user contacts*. This peer-awareness of the web-activities of the organisation's members may be used to ensure any inappropriate or unauthorised misuse of internet access may be effectively policed through social feedback, irrespective of any overt disciplinary measures available.

Prior art search engines prompt users of additional searches that were also performed by previous searchers performing the same keyword search, in an analogous manner, the present invention may provide the similar prompts though

with the additional feature than the user may be notified of the previous *user contacts* that also performed the same *keyword* search.

In a further embodiment, users can submit *recommendations* for sites limited to specific keywords. A user may for example be recommending a specific site,
5 though only when their company name is one of the *keywords* used. If the subsequent evaluation of the site by the *user contacts* is positive, with possible positive *appraisal/recommendations*, the web site may enhance its ranking in networks outside the user's *personal contacts network*.

Although a user may have a number of directly connected *user contacts* for
10 example, each may have particular strengths or weaknesses with regard to different searches the user may wish to undertake. Thus, the weighting of individual *user contacts* may be passively/automatically or actively adjusted based on various criteria such as usefulness of their browsing, reliability of results, their personal tastes, any *entity attribute* known to the system.

15 As examples, it may be know that *user contact* A has a passionate aversion to a particular software multinational and thus their *recommended* or accessed web-sites related to software may reflect this bias, and thus the user de-weights any input from *user contact* A for software searches. *User contact* B may produce excellent recommendations or searches during working hours but only accesses
20 gaming web-sites out of work hours. The *indicative information* input from *user contact* B may thus be de-weighted outside a certain time period.

In a further embodiment, a user may make use of a more active approach to alerting their *user contacts* to discovering particularly notable web-sites, rather than the more passive inclusion of the site on the search engine *suggestions*
25 entries in the conventional manner. This may be achieved in a variety of ways,

such as altering the appearance of the site in the suggestions listing e.g. being bolded, different coloured, appearing in a separate list and/or being e-mailed directly to the *user contact*. The *suggestions* listings themselves may also be distributed to other *user contacts* and even to unconnected entities via e-mail or
5 phone message texts.

The present invention could also be used as a replacement mechanism for the widespread e-mailing of jokes and the like between friends and workmates. Essentially, web-sites accessed by the user and rated accordingly are replaced by e-mails (optionally with attachments) containing the material to be distributed
10 to all the *user contacts*. Optionally, distribution may be filtered according to its rating by the user and subsequently by the *user contacts*, the various *entity attributes* of the *user contacts* or the degree of contact with the entity. Using the present invention in this manner ensures no one is e-mailed the same material twice and potentially offensive material is not sent to the wrong *user contact*. It
15 will be appreciated that the material need not be jokes, but may instead be any form of information, including text, images, and audio recordings. The system may be configured such that such e-mails may be forwarded to a specific link associated with the search engine and the subsequent distribution is handled automatically.

20 In a further embodiment, the present invention incorporates a book-marking system, whereby a user accessing a notable web-site may use a book-marking feature on the search engine web-site or toolbar to add the bookmarked web-site to a compilation list of other bookmarked sites deemed to be of sufficient interest to the user that they are permanently retained on the list so as to be continually
25 accessible and available.

The present invention may also be used to aid blogging communities to create trusted search tools for blog content.

According to a further aspect of the present invention there is provided a search engine system capable of displaying *indicative information* to a user from
5 searches performed by entities (or as 'user contacts') connected directly or indirectly with the user, wherein said system includes;

- at least one host computer processor connectable to one or more network(s),
- a database accessible over said network(s),
- a plurality of data input devices connectable to said network(s),
- 10 – a search engine accessible over said network(s),
- wherein said system is capable of forming said private *personal contacts network* for each of one or more users by receiving input from the said user including at least one identifying characteristic of the user and of one or more chosen entities known to said user,
- 15 – recording said identifying characteristic of each entity including the user to form one or more corresponding entity data records in said database,
- notifying the or each chosen entity of their recordal on said system and requesting input of at least one identifying characteristic of one or more further entities known to the or each said chosen entity,
- 20 – recording the identifying characteristic of each further entity inputted by the or each said chosen entity to form further corresponding entity data records,
- repeating the above steps of successive notification of further entities and

recordal of the identifying characteristic of each further entity chosen as further entity data records,

- providing searchable access to at least part of the entity data records stored in said database and to the internet.

- 5 Searchable access to an entity data record may be restricted by the entity to said *user contacts*.

Preferably, said data input devices are computer terminals, PDAs, telephones, mobile phones, laptops, notebooks, any other portable personal computing device connectable to said network, preferably but not limited to the internet.

- 10 Said data input devices may provide webpage, e-mail, text message, DTMF tone, voice or video access to the said host computer or between entities and/or web-browsing access to said host computer via a dedicated web-site interface.

The additional data obtained from the entity's identifying characteristics may be used to provide users with the means of obtaining information related to specific

- 15 search applications from within their own unique extended private *personal contacts network* of contacts.

According to a further aspect of the present invention there is provided a method of creating a private *personal contacts network* for interaction with a search engine system as described above, said method including the steps performed

- 20 by a processor of a data processing and storage system, of:

- receiving input from the said user including at least one *identifying characteristic* of the user and at least one chosen entity known to said user and hereinafter referred to as a *user contact*;
- recording said *identifying characteristic* of each *user contact* including the

user to form at least one corresponding *user contact* data record in said database;

- notifying the or each *user contact* of their recordal on said system and requesting input of at least one identifying characteristic of at least one further entity known to the *user contact*;
- recording the identifying characteristic of each further entity inputted by the or each *user contact* to form further corresponding *user contact* data records;
- repeating the above steps of successive notification of further entities and recordal of the identifying characteristic of each further entity chosen as further *user contact* data records;
- providing searchable access to at least part of the *user contact* data records stored in said database.

It can thus be seen that the present invention provides a means of combining and enhancing the attributes of the earlier search engine and private network systems disclosed in US Patent No. 6,421,675 and PCT application PCT/NZ02/00199 together with the addition of a powerful set of new inventive features to provide a customisable search engine, with social feedback.

BRIEF DESCRIPTION OF DRAWINGS

Further aspects of the present invention will become apparent from the following description which is given by way of example only and with reference to the accompanying drawings in which:

Figure 1. shows a preferred embodiment of the present invention in the form of a home web-page of an internet search engine;

Figure 2. shows an extension of the suggestion fields shown in figure 1;

Figure 3. shows a web-page listing of search results obtained using the present invention of a search engine;

Figure 4. shows a login screen of the present invention;

5 Figure 5. shows a membership invitation form for the present invention, and

Figure 6. is a schematic representation of a preferred embodiment of the present invention.

BEST MODES FOR CARRYING OUT THE INVENTION

The present invention relates generally to a means of harnessing the
10 discriminatory powers of the knowledge, opinions and recommendations of an
entity's extended network of contacts in an efficient and systematic manner to
provide an effective means of searching the internet (or other databases) with
social feedback from the user's *personal contacts network*. There are numerous
potential applications for the present invention of which the examples described
15 in more detail below are by way of illustration only.

Figures 1-5 show a preferred embodiment of the present invention in the form of
an Internet search engine (1) capable of conventional "all internet" searches or
optionally, being customised to display *indicative information* from entities
connected directly or indirectly with the user (2). Any such entity connected to
20 the user (2) in this manner is referred to as a *user contact*. In the embodiment
shown, all the entities comprising the *user contacts* are individuals, though it will
be appreciated that an entity may also be any individual, family, personal or
organised network, organisation, club, society, company, partnership, religion, or
entity that exists as a particular and discreet unit. The operation of the search

engine (1) in the performance of standard, uncustomised "all internet" searches is well known to those in the art and is not discussed further herein.

In a departure from prior art search engines, the present invention search engine (1) includes a plurality of *suggestions* (3). Figure 1 shows an embodiment with
5 four types of *suggestions* (3), consisting of *recent searches* (4), *recent sites* (5), *popular searches* (6) and *popular sites* (7). Each of these *suggestions* (3) displays *indicative information* from the *user contacts*. It will be appreciated that numerous alternative suggestions may be used without departing from the scope of the invention.

10 While the present invention (1) may use any user (2) to supply the *indicative information* for the *suggestions* (3), in the preferred embodiment shown, this information is derived from the *user contacts* with whom the user (2) has some existing relationship, and are members of a private network (not shown), associated with the user (2). The private network (as more fully described in the
15 co-pending application by the same applicant, PCT/NZ02/00199) enables the user (2) to characterise the relationship between themselves and their personal *user contacts* and to filter/manage interaction with the *user contacts* according to the *interrelationship context information* defining the relationship. In a preferred embodiment, the *interrelationship context information* includes a *connection*
20 *factor* and one or more *entity attributes*. The *connection factor* provides a measure of the degree of separation between the user (2) and the *user contact*, i.e. *user contacts* known directly to the user (2) may be termed "*direct contacts*" whilst *user contacts* known to the user (2) via one or more intermediary *user contacts* are known as "indirect contacts". Any 2 entities having no intermediate
25 contacts said to be "disconnected". Therefore, it can be seen that *direct contacts* can be termed a 1st order contact whilst their own *direct contacts* will become 2nd

order contacts to the user (2) (unless they are also *direct contacts* of the user (2) as well) and so forth.

The *suggestions* (3) showed in figure 1 represent the web-related activities of the *user contacts*. The particular *user contacts* providing data for the *suggestions* (3) may be filtered or weighted according to the individual *connection factor* with the user (2). The system also records at least one *entity attribute* (not shown) for each of the *user contacts* as part of the *interrelationship context information*, and this may include a variety of personal details, information regarding personal details, factors or interests; friends; relations; school alumni; employment factors; business colleagues; professional acquaintances; sexual preferences, persuasions, or proclivities; sporting interests; entertainment, artistic, creative or leisure interests; travel interests, commercial, religious, political, theological or ideological belief or opinions; academic, scientific, or engineering disciplines; humanitarian, social, security/military or economic fields and any combination of same.

The *entity attributes* may also form part of the *eligibility criteria* for the *user contact* to contribute to the *suggestions* (3). Regarding the individual *suggestions* (3), the *recent searches* (4) denote the most recent *keywords* (8) used by the *user contacts*. The search engine (1) may be configured so that the searches by the user (2) are also shown in the *recent searches* (4) window, giving a real-time indication to the user (2) of the rate of new searches appearing in the *recent searches* (4) window. An expanded listing (including previous entries) of *suggestions* (3) may be accessed by a link (9) which leads to the search engine (1) web-page shown in figure 2.

The *popular searches* (6) show a ranking of the most popular *keywords* (8) used by the *user contacts*, whilst the popular web-sites (7) show a ranked list of web-

sites (10) most regularly visited and/or recommended by the *user contacts*. The home web-page of the search engine (1) as shown in figure 1, also includes the keyword entry field (11) and 2 alternative settings to record each search as either "a shared search (12)", or "a private search (13)". Clicking on the "shared search link" (12) configures the search engine to record the *keywords* (8) inputted by the user (2) for inclusion in the *recent searches* (4) and also the listing of web-sites resulting from the search, and any sites accessed thereafter by the user (2) for inclusion in the *recent sites* (5) listing. Figure 3 shows the resulting search results (14) for the *keyword* (8) "skateboard". It can also be seen that in the *recent searches* (4) field the term "skateboard" is the most recent *keyword* (8). In contrast, the *popular searches* (6) shows the "skateboard" as the second most popular search *keyword* (8), indicating that despite its recent use, the term "flowboard" has been used more frequently as a *keyword* (8). If the user (2) clicks the private search link (13), none of the user's (2) activities would be recorded by the system (1).

The initial search engine (1) web-page shown in figure 1 also includes links (9) to invite entities to join the user's (2) network and links (9) to configure/see the user's (2) network (15, 16 respectively). A further link (17) provides the login/logout feature of incorporating the user's (2) *personal contacts network* to interact with the search engine (1).

It can also be seen in figure 3 that the search for a *keyword* (8) skateboard has also yielded a listing of "related web searches found" (18). These related web searches (18) show searches also performed by the *user contacts* in conjunction with searches for the *keyword* (8) skateboard.

In contrast to prior art search engines, the *suggestions* (3) have far greater significance to the user (2) as the opinions of the *user contacts* are far more likely

to be of greater significance and given more credibility by the user (2) than *suggestions* (3) emanating from data collected from any ordinary user of the search engine (1). As previously referred to, the *user contacts* contributing to the *suggestions* (3) may be unrestricted, i.e. all contacts contribute equally, or
5 configurable by the user (2) to give a preference or *weighting* to specific *user contacts*. This may be based on a variety of factors including the *connection factor*, (e.g. choosing *direct contacts* to provide twice the number of *suggestions* (3) than 2nd degree contacts), and/or relating to an *entity attribute*, e.g. the search for the *keyword* (8) skateboard may be supplemented by filtering the *user*
10 *contacts* for the *suggestions* (3) according to an *entity attribute* of "an interest in skateboarding".

A user (2) may find particular *user contacts* provide interesting selections and/or relevant web-sites and consequently may be given a higher weighting by placing their *suggestions* (3) higher up the listings and/or providing a greater number of
15 inputs. In a further aspect of the preferred embodiment, the *user contacts* and the user (2) are provided with a number of *recommendations* (not shown). These may be used to increase the ranking of particular web-sites for *keyword* (8) searches (optionally, *recommendations* may be tied to particular *keywords* (8)) and/or may be used to promote sites in the *popular sites* (7) field.

20 The number of *recommendations* given to each *user contact* may be fixed or varied according to several eligibility criteria. These may include positive feedback from other *user contacts* (either by active *recommendations* or by automatic/passive affirmations resulting from *user contacts* accessing the *recommended* web-sites submitted). Alternatively, they may be re-issued after a
25 given time period. *User contacts* with particular *entity attributes* associated with specific *keywords* (8), may also be given additional recommendations, e.g. a

computer software reviewer may be given supplementary *recommendations* to appear in the related web search field (18) and/or associated with particular searches and specific software-related *keywords* (8).

5 The present invention also provides a means of contacting the *user contacts* responsible for particular *keywords* (8) or *suggestions* (3) and/or those having accessed a particular web-site irrespective of whether it appears in the *suggestions* (3) field. This contact may be anonymously or, via an intermediary web-site or anonymous e-mail or alternatively, the users (2) may agree to their identity being shown by the system (1).

10 The ability of the present invention to apply selective input and filtering from the activities of the *user contacts* is also of interest for further web searching and/or information gathering by the user (2) and also reduces potential time wasted on unproductive searches and helps to more rapidly find relevant results.

15 The *indicative information* provided by the *user contacts* will also be used to weight search results (14) associated with a particular *keyword* (8). The search weighting may be performed by active *recommendations* from individual *user contacts*, thereby promoting particular web-sites or by passive/automatic feedback, as described in the earlier US Patent No. 6,421,675 (and associated applications). US Patent No. 6,421,675 discloses a powerful means of weighting
20 search results according to the behaviour of the user's accessing results listing. According to those criteria, a site may be deemed more useful if a user accesses the link and either remains on the site for a predetermined time and/or performs other actions indicating the site has relevance, i.e. downloading material, following related links, reading additional pages or subscribing to material at the
25 site. Conversely, if a web-site is accessed and immediately exited, this implies the site was of little relevance for the search keyword. These techniques may

also be incorporated in the present invention in addition to the refinement of giving increased weighting according to which entities performed the search, i.e. the *user contacts*. Thus, the selections and associated searches performed by a *direct contact* may be considered of greater significance than an indirect contact and/or the behaviour of an unconnected entity and used to weight the results accordingly.

In a further embodiment, the features of the search engine (1), and in particular the *suggestions* (3) may be combined into a minimised toolbar which forms part of a stay-resident program running in conjunction with the user's (2) web-browser (not shown). The toolbar may also monitor the web-sites visited by the user (2) and in turn suggest additional web-sites that have previously been accessed by other *user contacts* who have also visited the same site and/or performed the same searches leading to that site.

In a further embodiment (not shown), the search engine (1) may be customised to be the search engine for a particular web-site and have the option of restricting the search to the material on the host web-site. A corresponding list of *suggestions* (3), may thus be created relating to the activity of the user's (2) *user contacts* who have visited the web-site. The *suggestions* (3) may be expanded to include lists of products either accessed and/or recommended by the *user contacts*.

The present invention may also be used with organised networks such as companies, institutes, or any other network whereby all the members have at least one common *entity attribute* and *connection factor*, i.e. they are all members of an organisation and are *direct contacts* respectively. The present invention provides the capability of treating such organised networks as either a single entity, with its own collective *entity attributes*, or as a collection of

individual *user contacts*, each having the organised network as a common *entity attribute*. Numerous refinements are possible with the present invention such as the ability for the users (2) to actively mark web-sites of particular merit by ensuring their appearance in the *suggestions* (3) is suitably distinct (e.g. in a different font, or bold, or the like) and/or by sending an e-mail to chosen *user contacts* alerting to the web-site. It will be seen that before the user (2) has any *user contacts* registered for use with the system and able to impact on the web activities and searches of the user (2), it will be necessary to populate the *suggestions* (3) fields from non *user contact* entities. Even when sufficient *user contacts* are available, such disconnected entities may still be used to contribute to the *suggestions* (3) if so desired by the user (2).

Nevertheless, the paramount aspects of the benefits of the present invention relate to the incorporation of the personal private network for the user (2). In order to access this feature of the search engine (1), the user (2) uses the login/logout link (17) which leads to the web-page (21) shown in figure 4. Existing users (2) enter their e-mail and password (19) whilst new users deciding to sign up to the network submit their first and last name, preferred e-mail address, location and new password via corresponding input fields (20). Upon joining the search engine (1) registered members, the user (2) may then invite his or her acquaintances to become members, i.e. their *user contacts*. Alternatively, the user (2) who themselves have been invited to join the system by an existing member. Figure 5 shows a web-page form (22) for inviting entities currently unconnected to the user's (2) network to join.

It will be appreciated that the present invention may be implemented in numerous physical configurations. Although the present invention may be implemented in any suitable environment with a searchable database on a network, the preferred

embodiment as shown in Figure 6 is described with respect to use on the internet (23) in which a plurality of users (not shown) may access the search engine (1) through the internet (23) via a plurality of user sites (24) such as personal computers, laptops, mobile phones, PDAs or the like.

- 5 It will be appreciated that figure 1 is symbolic only and that the internet (2) is actually composed of a multitude of user sites (24) and that searchable data may be obtained from a plurality of data sources (25). It will be appreciated that the data sources (25) may represent numerous data sources including one or more personal contact networks (26) individually associated with one or more users.
- 10 Moreover, although the search engine (1) is depicted as a single device, it may be distributed across a network environment including one or more data storage means (not shown), databases, server computers, processors and although these are not explicitly shown, they are generically represented and encompassed by representation of the search engine (1).
- 15 Aspects of the present invention have been described by way of example only and it should be appreciated that modifications and additions may be made thereto without departing from the scope thereof.